2005 FIRST Robotics Competition - Inspection Check List Team No. _____

Inspector:_____

Signature **time/date** **printed name and initials**

signature above indicates that the robot has passed inspection

GENERAL				
ITEM	**PASS**	**DESCRIPTION**	**RULE(S)**	**COMMENTS**
1		Additional materials total cost is $ 3,500 or less with $ 400 per individual non-electronic component max and $200 per individual COTS electronics component max, **attach copy of detailed bill-of-materials to this worksheet (used components must be included without depreciation)**	R35 to R46	
2		Size: Must fit freely in sizing box in ready-to-run condition, w/o bumpers (28"x 38"x 60")	R04 to R06, G01	
3		Weight: All possible configurations combined, including decorations, 7.2V backup battery & bumpers but excluding the Exide ES/EX18-12 battery & its Anderson Connector w/leads , must be 120.0 lbs or less	R08	
4		Inspect all mechanisms and configurations that may be present on the robot during the entire competition event.	R99	
5		No energy sources other than the Exide ES/EX18-12 battery, 7.2V backup battery, compressed air supplied by the Thomas compressor and stored within the pneumatics tank(s) (all components from the kit), dropping of robot's center-of-gravity and "safe" deformation of robot components (eg springs)	R02	
6		No hazardous protrusions or sharp items that could harm people, playing field, or game elements	R03 and G26	
7		No mechanisms or components that pose a risk of entanglement	R25 and G25	
8		Any devices that are used to constrain the robot's starting size to within the acceptable "start-of-match" dimensions must remain attached throughout the match	R07	
9		Team number must be prominently displayed – at four locations approx. 90 degrees apart around the robot's perimeter with numerals that are at least 4" high and ¾" stroke and in a contrasting color. Also, school name must be displayed and sponsor name and/or logo must be displayed.	R09	
10		Robots must use the two Team Color LEDs on opposite "sides" and be visible.	R10	
11		No disallowed components – 1) Victor 883 and 885 Speed Controllers 2) motor and air storage tank quantities greater than the number in kit (more HITEC HS-322HD servos are OK) 3) parts and materials that are not "generally available" 4) hydraulic fluids or hydraulic components 5) motors, batteries, air compressor, pressure relief valves or air storage tank different from parts in the kit (due to kit mixup - previous years' Fisher-Price motors and gearboxes are OK) 6) circuit breakers diff from Bussmann & Snap Action parts in kit 7) solenoids, pumps, actuators other than those included in the kit	R17 to R22, R38, R39, R79 Flow-chart	
12		No devices or decorations intended to interfere with or jam another robot's vision system	R26	
13		No traction devices & anchors that may damage the field or game structures (no metal, sandpaper, tape, cleats or similar)	R27	

14		No tape except 1) Velcro (or any hook-and-loop tape) or double-sided sticky foam, 2) reflective tape for optical sensors (in small amounts), 3) labels and 4) electrical tape (only used for insulation)	R28	
15		No hazardous materials per MSDS sheets	R39	
16		No excess lubricants that could contaminate playing surfaces or robots	R29	
17		Any bumpers used on the robot must – 1) extend no more than 4" beyond the robot's starting dimension (in a horizontal plane) 2) be between 2" and 8" above the floor 3) be designed to stay attached during the match 4) not contain "hard" materials	R30	
18		Only allowed motor modifications – 1) mounting and housing elements of motors may only be changed and 2) gearboxes for the Fisher-Price and Globe motors may be removed	R31	

PNEUMATICS (if incorporated in robot design)				
ITEM	**PASS**	**DESCRIPTION**	**RULE(S)**	**COMMENTS**
19		No disallowed pneumatic component modifications. All tubing must be SMC TIUB07 series (1/4" ID, any color) with max total length of 20m.	R85	
20		Must include pressure gauges on the compressor output/Clippard accumulator(s) and all regulator outputs. When operating, the compressor output/Clippard accumulator(s) pressure cannot exceed 120PSIG and the regulator outputs cannot exceed 60PSIG. Confirm pressures.	R86, R89	
21		A manually-operated pressure vent valve must be present on the compressor output/Clippard accumulator(s) line and easily accessible. Confirm valve operation to relieve all pressure.	R86	
22		No modifications to the 125PSIG relief valve attached to the compressor.	R87	
23		No extraneous tubing and no more than 2 Clippard accumulators.	R02, R87	
24		Nason Co. pressure switch must be attached to the compressor output/Clippard accumulator(s) and be wired to the digital I/O port on the Robot Controller. The pressure switch CANNOT be used to directly power the compressor.	R88	
25		All pneumatics components must be "off-the-shelf" and rated for operation at 125PSIG (pressure sensors only need to be rated for the expected pressure at the sensor). Additional air cylinders and rotary actuators must be identical to components listed on the Pneumatics Components Order form and obtained from a Bimba or Parker distributor.	R90	
26		Compressors other than the Thomas unit included in the kit may not be used. Vacuum generators (driven by a motor from the kit) and gas shocks can be used.	R91	

ELECTRICAL & CONTROLS				
ITEM	**PASS**	**DESCRIPTION**	**RULE(S)**	**COMMENTS**
27		Connect the Operator Interface to the tether port of the Robot Controller and power-up the robot. Confirm that the Team Color LEDs both blink at start-up and that the team number is properly displayed on the Operator Interface.	R10, R59, R64	
28		Only one Exide ES/EX 18-12 robot battery	R46	
29		Insulated 12V battery terminals and SLU-70 lugs for connection	R48	
30		Battery connected to 120A main breaker via Anderson Quick-Disconnect connector	R48	
31		Main circuit breaker is accessible	R48	
32		#6 AWG wire minimum from battery (+ and -) to Anderson Disconnect and to main circuit breaker and CB/Distribution Panel	R48	

33		Proper wire color for power distribution (red/white/brown for positive; black/blue for negative).	R48	
34		Robot Controller is accessible for inspection and its indicator lights are readily visible.	R57	
35		Circuit Breakers are accessible for inspection.	R58	
36		CIM and Fisher Price motors can only be connected to a Victor 884 Speed Controller (cannot be connected to Spike Relay Modules)	R78	
37		Only one motor per Victor 884 Speed Controller**.**	R77	
38		Motors, compressor, and sol. valves wired to relay modules or speed controllers, and not directly to breakers.	R61	
39		Sensor outputs wired to Robot Controller Analog Inputs, Digital I/O, TTL Serial, Program Port, or Custom Circuit board only. No series connections with motors, etc., **except** current sensor bus connected in series with load being monitored.	R61	
40		20A, 30A or 40A circuit breaker in series with each speed controller	R83	
41		20A circuit breakers must be used to provide power to all Spike Relay Modules, the Air Compressor (if used), Custom Circuits, Additional Electronics and the Robot Controller. Multiple loads may be attached to each Spike Relay Module but only one motor per module is allowed. No other loads may be attached to the Circuit Breakers that provide power to the Robot Controller and Air Compressor.	R80, R81, R82 R84	
42		#12 AWG wire min for all circuits protected by 40A Circuit Breaker #14 AWG wire min for all circuits protected by 30A Circuit Breaker #18 AWG wire min for all circuits protected by 20A Circuit Breaker (wire pre-installed on motors is exempt, can be shortened but not replaced)		
43		#24 AWG wire minimum for connecting sensors, Vision System, small muffin fans, LEDs or PWM signals to the Robot Controller. Ribbon cable smaller than #24 AWG may be used to connect to the 9 pin ports on the Robot Controller.	R76	
44		No exposed electrical conductors. No wires in electrical contact with robot metal chassis. No chassis parts used to carry electrical currents.	R49	
45		Custom Circuits may connect to the Robot Controller's Analog Input, Digital I/O, TTL Serial, PWM, Relay or Program Ports. In addition, custom circuits may connect to Branch Circuit breaker outputs, Speed Controller or Relay Module outputs or any kit or COTS sensors.	R51, R52	
46		Custom Circuits may NOT interfere with other robots, directly affect any output devices (eg generating a PWM signal for the Speed Controller), be used for wireless communication or connect to the Radio or Tether Ports on the Robot Controller	R53	
47		No modifications to Robot Control system and its components.	R55	
48		RESET/PROG button on Robot Controller is accessible or wired to an accessible switch	R63	
49		7.2V NiCad "backup" battery is connected to the Controller	R62	
50		Decorations may draw power from the 12V battery but must be protected via either 20A or 30A circuit breaker and cannot interfere with other control system components. Decorations may draw power from a separate battery but must not be connected to the rest of the robot's electronics in any way.	R95	

Team Compliance Statement

We, the Team Mentor, Team Captain and Team Inspector, attest by our signing below, that our team's robot was built after the 2005 Kickoff on January 8, 2005 and in accordance with all of the 2005 FRC rules, including all Fix-It Window rules (reference Section 5.3.3). We have conducted our own inspection and determined that our robot satisfies all of the 2005 FRC rules for robot design.

Team Captain:_____

Team Inspector:_____

Team Mentor:_____